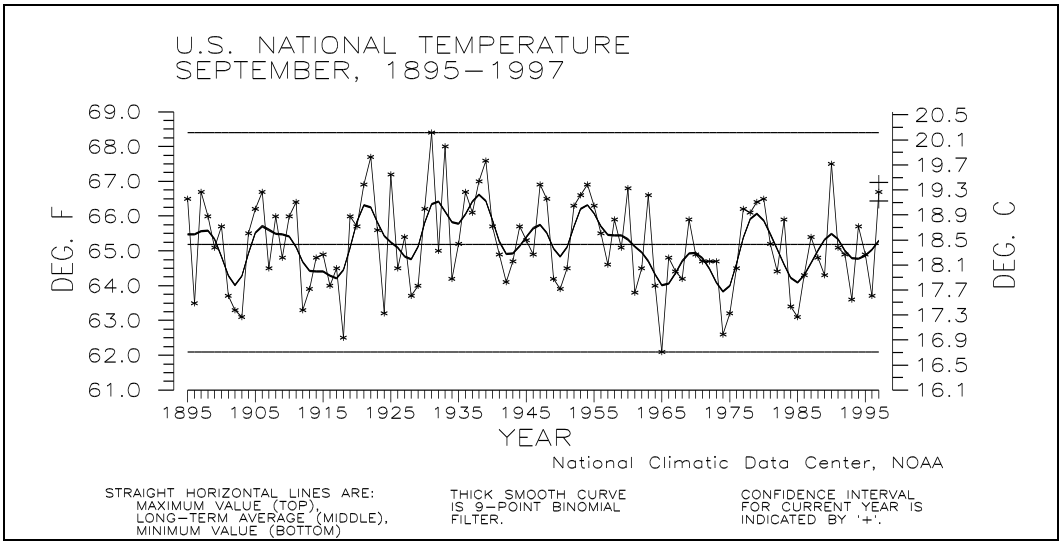
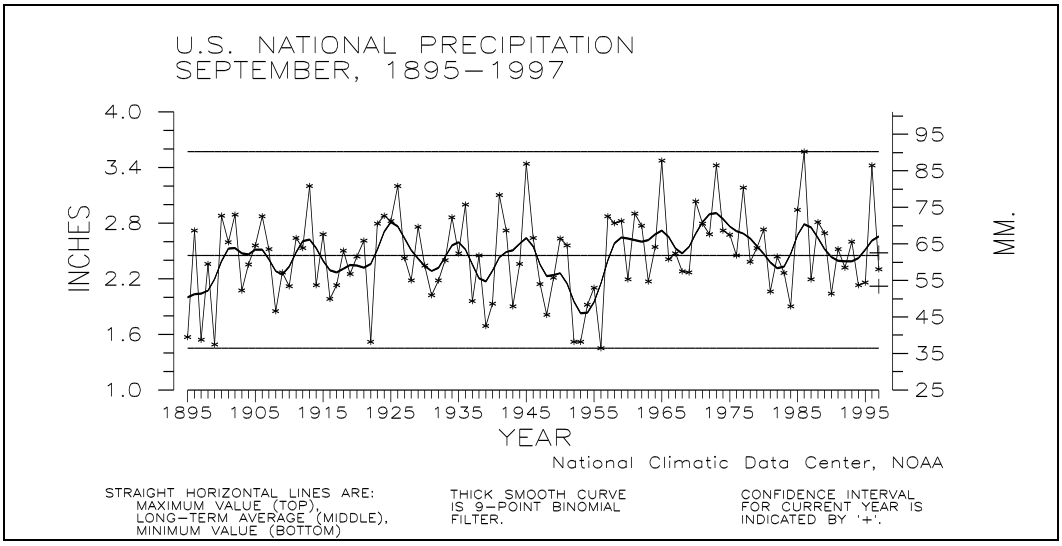
SEPTEMBER 1997 **HISTORICAL CLIMATOLOGY SERIES 4-7**
Volume 9 Number 9

CLIMATE VARIATIONS BULLETIN





noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE / NATIONAL CLIMATIC DATA CENTER ASHEVILLE, N.C.

This CLIMATE VARIATIONS BULLETIN (CVB) is a preliminary report that puts current monthly climate anomalies into historical perspective using climate databases archived at the National Climatic Data Center (NCDC). It is issued on a monthly basis. Supplemental sections are included which address seasonal and annual perspectives, when appropriate.

Current data are based on preliminary reports from River Forecast Center stations and First and Second Order airport stations obtained from the National Weather Service (NWS) Climate Prediction Center (formerly, Climate Analysis Center), and preliminary tornado statistics obtained from the NWS National Severe Storms Forecast Center. THE CURRENT DATA SHOULD BE USED WITH CAUTION. These preliminary data are useful for estimating how current anomalies compare to the historical record, however the actual values and rankings for the current year will change as the final data arrive at NCDC and are processed.

The following NCDC datasets are used for the historical data: the climate division drought database (TD-9640), the hurricane datasets (TD-9636 and TD-9697), the tornado dataset (STORM DATA), and the monthly station dataset (LCD supplemental files). It should be noted that the climate division drought database consists of monthly data for 344 climate divisions in the contiguous United States. These divisional values are calculated from the 6000+ station Cooperative Observer network.

If you have access to the Internet, copies of the CVB are available via both the NCDC's World Wide Web (WWW) server and the NCDC's anonymous FTP server.

NCDC's WWW server
URL for the CVB: http://www.ncdc.noaa.gov/ol/documentlibrary/cvb.html

NCDC's anonymous FTP server
Machine: ftp.ncdc.noaa.gov
Directory: /pub/data/cvb

If you are a climate researcher and would like to order copies of the historical datasets used to make graphs of the type in this report, call 704-271-4994 or fax a letter to 704-271-4876 or mail a letter to the address given below, ATTN: Research User Services.

All other questions or requests for data should be made by calling 704-271-4800 or sending a fax to 704-271-4876 or by writing to:

National Climatic Data Center, NOAA
Federal Building
151 Patton Avenue, Room 120
Asheville, NC 28801-5001

If you use any of the information from this CVB, please identify "National Climatic Data Center, NOAA" as the source.

UNITED STATES SEPTEMBER CLIMATE IN HISTORICAL PERSPECTIVE

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****Notice: The December/Annual 1997 issue of the *Climate Variations Bulletin* will be the last paper copy issue mailed. Expect mailing around January 20, 1998. The CVB will continue to be available at our website.**

TABLE 1. PRECIPITATION AND TEMPERATURE RANKS, BASED ON THE PERIOD 1895-1997. 1 = DRIEST/COLDEST, 103 = WETTEST/WARMEST FOR SEPTEMBER 1997, 103 = WETTEST/WARMEST FOR AUG-SEP 1997, 103 = WETTEST/WARMEST FOR APR-SEP 1997, 102 = WETTEST/WARMEST FOR OCT 1996-SEP 1997.

REGION	SEP 1997	AUG-SEP 1997	APR-SEP 1997	OCT 1996-SEP 1997
PRECIPITATION:				
NORTHEAST	33	46	10	50
EAST NORTH CENTRAL	24	19	12	52
CENTRAL	25	27	8	40
SOUTHEAST	59	15	30	39
WEST NORTH CENTRAL	44	39	52	72
SOUTH	32	39	48	65
SOUTHWEST	90	82	60	55
NORTHWEST	91	88	99	102
WEST	94	91	68	81
NATIONAL	39	25	22	76
TEMPERATURE:				
NORTHEAST	33	26	9	47
EAST NORTH CENTRAL	78	44	25	20
CENTRAL	39	18	5	23
SOUTHEAST	51	38	4	39
WEST NORTH CENTRAL	93	86	63	31
SOUTH	79	58	11	37
SOUTHWEST	88	87	68	86
NORTHWEST	90	99	90	86
WEST	93	99	96	97
NATIONAL	89	75	31	50

TABLE 2. EXTREMES, 1961-90 NORMALS, AND 1997 VALUES FOR SEPTEMBER. IT SHOULD BE NOTED THAT THE 1997 VALUES WILL CHANGE WHEN THE FINAL DATA ARE PROCESSED.

PRECIPITATION (INCHES)

REGION	DRIEST VALUE	DRIEST YEAR	WETTEST VALUE	WETTEST YEAR	NORMAL PCPN	1997 PCPN
NORTHEAST	1.25	1914	6.68	1938	3.63	2.98
EAST NORTH CENTRAL	.95	1952	7.21	1986	3.60	2.50
CENTRAL	.70	1897	6.94	1926	3.63	2.56
SOUTHEAST	1.91	1919	9.26	1979	4.33	4.55
WEST NORTH CENTRAL	.47	1952	3.42	1973	1.61	1.33
SOUTH	.88	1956	6.88	1913	3.67	2.49
SOUTHWEST	.09	1956	3.07	1941	1.46	1.92
NORTHWEST	.12	1975	3.42	1959	1.33	1.95
WEST	.03	1974	2.00	1976	.62	1.13
NATIONAL	1.45	1956	3.57	1986	2.63	2.30*

* PRELIMINARY VALUE, CONFIDENCE INTERVAL + OR - .18 INCHES

TEMPERATURE (DEGREES F)

REGION	COLDEST VALUE	COLDEST YEAR	WARMEST VALUE	WARMEST YEAR	NORMAL TEMP	1997 TEMP
NORTHEAST	56.2	1918	66.5	1961	59.8	59.3
EAST NORTH CENTRAL	53.5	1918	65.6	1931	58.8	60.7
CENTRAL	60.5	1918	73.6	1925	66.7	66.4
SOUTHEAST	68.9	1967	80.3	1925	73.2	73.8
WEST NORTH CENTRAL	47.4	1965	62.7	1897	56.8	60.7
SOUTH	67.7	1974	79.5	1911	73.6	75.8
SOUTHWEST	59.0	1912	67.3	1983	63.9	66.2
NORTHWEST	52.7	1926	62.7	1990	57.3	60.1
WEST	61.0	1986	69.9	1979	65.9	68.5
NATIONAL	62.1	1965	68.4	1931	64.8	66.7*

* PRELIMINARY VALUE, CONFIDENCE INTERVAL + OR - .3 DEG. F.

TABLE 3.

STATISTICS FOR SELECTED RIVER BASINS: PRECIPITATION RANKING FOR OCT-SEP 1996-97, WHERE RANK OF 1 = DRIEST, 102 = WETTEST, BASED ON THE PERIOD 1895 TO 1997, AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM (PALMER) DROUGHT, AND AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM (PALMER) WET CONDITIONS, AS OF SEPTEMBER 1997. RIVER BASIN REGIONS AS DEFINED BY THE U.S. WATER RESOURCES COUNCIL.

RIVER BASIN	PRECIPITATION RANK	% AREA DRY	% AREA WET
MISSOURI BASIN	52	1.8%	25.6%
PACIFIC NORTHWEST BASIN	102	.0%	52.7%
CALIFORNIA RIVER BASIN	77	6.7%	.0%
GREAT BASIN	85	.0%	.0%
UPPER COLORADO BASIN	73	.0%	31.6%
LOWER COLORADO BASIN	36	43.9%	.0%
RIO GRANDE BASIN	52	.0%	3.9%
ARKANSAS-WHITE-RED BASIN	64	.0%	16.2%
TEXAS GULF COAST BASIN	71	.0%	.0%
SOURIS-RED-RAINY BASIN	43	.0%	8.5%
UPPER MISSISSIPPI BASIN	40	.0%	.0%
LOWER MISSISSIPPI BASIN	80	.0%	16.2%
GREAT LAKES BASIN	70	.0%	.0%
OHIO RIVER BASIN	33	.0%	.0%
TENNESSEE RIVER BASIN	73	.0%	.0%
NEW ENGLAND BASIN	52	.0%	7.7%
MID-ATLANTIC BASIN	40	7.1%	.0%
SOUTH ATLANTIC-GULF BASIN	45	.0%	.0%

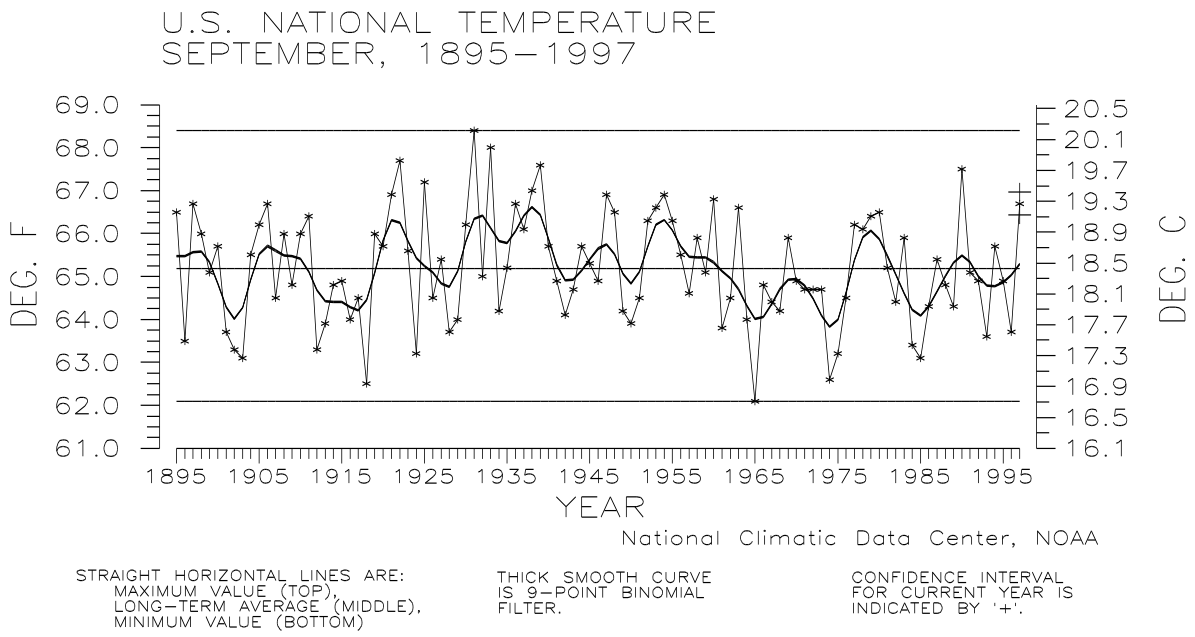

Figure 1: Preliminary data for September 1997 indicate that temperature averaged across the contiguous United States was above the long-term mean ranking as the 15th warmest September since 1895. Sixteen percent of the country was much warmer than normal while none of the country was much cooler than normal.

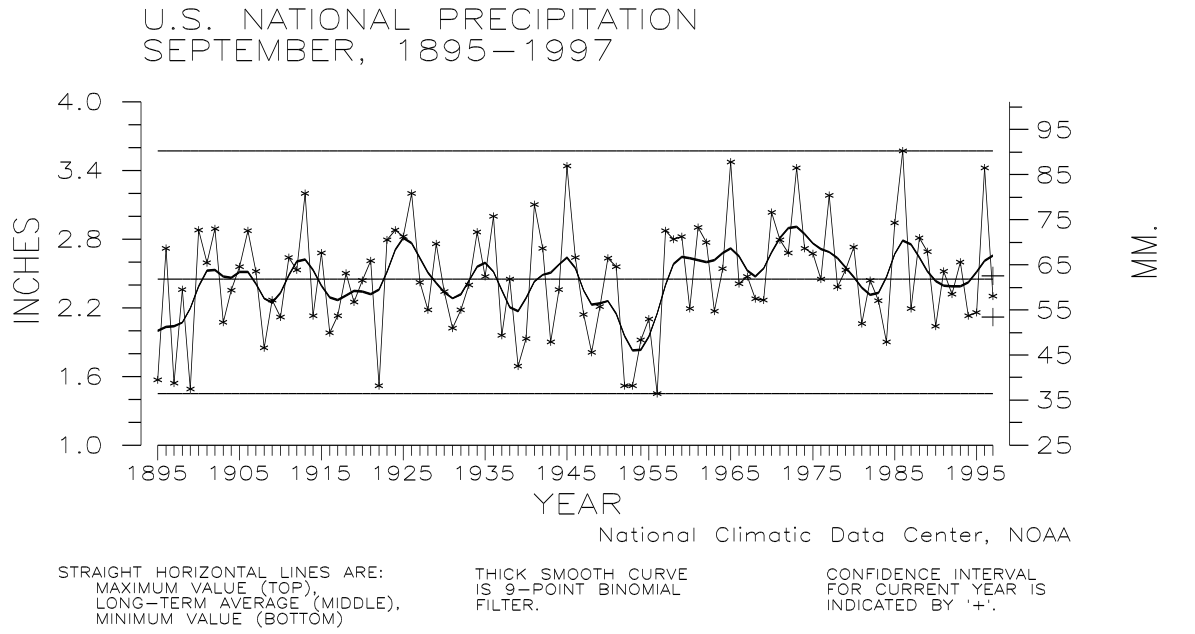

Figure 2: Preliminary precipitation data indicate that September 1997 was the 39th driest such month since 1895. Nearly four percent of the country experienced much drier than normal conditions while about nine percent of the country was much wetter than normal.

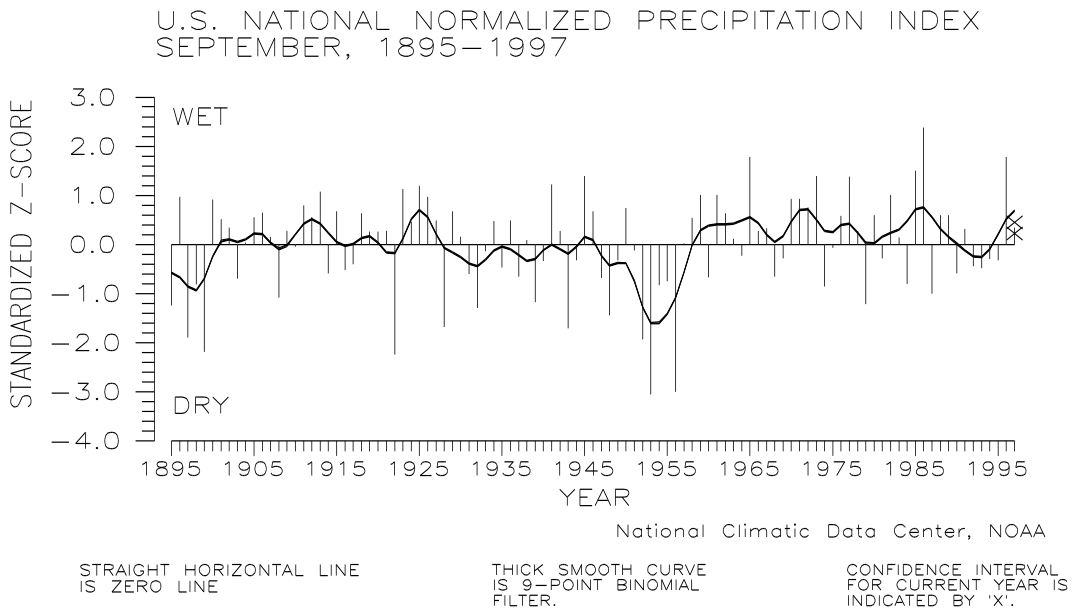

Figure 3: The preliminary national standardized precipitation index ranked September 1997 as the 42nd wettest such month on record. This standardized z-score is estimated to be accurate to within 0.114 index units and its confidence interval is shown as an 'X'.

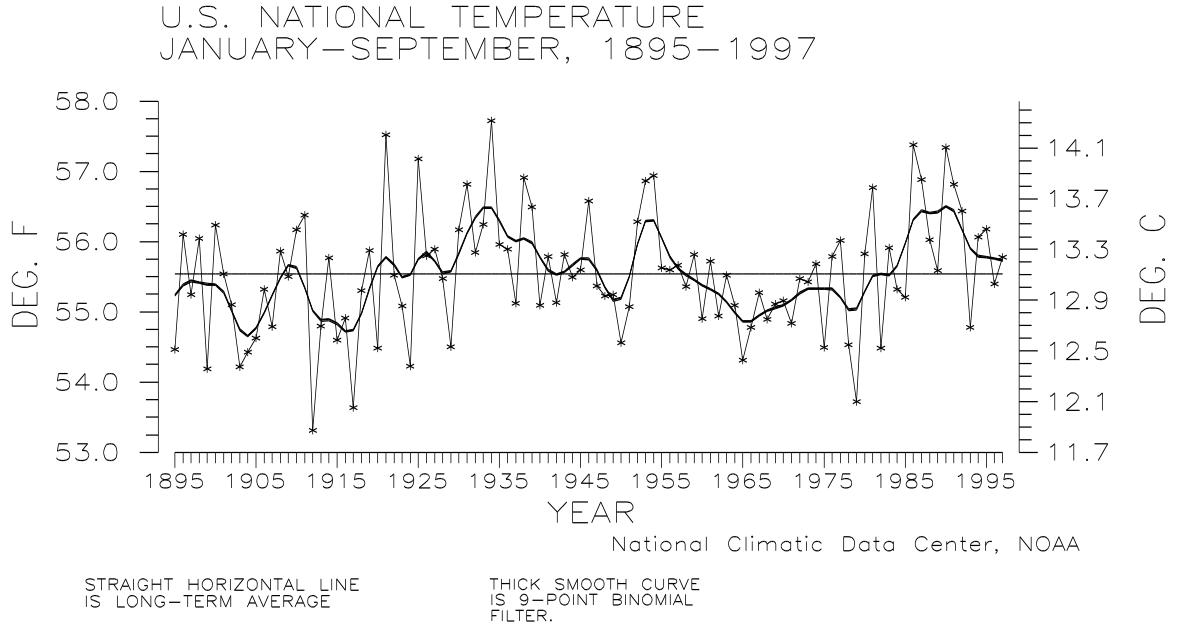

Figure 4: Based upon preliminary data, January-September 1997 was the 41st warmest such period on record. Nearly 11% percent of the country had much warmer than normal January-September temperatures while about three percent of the country was much cooler than normal.

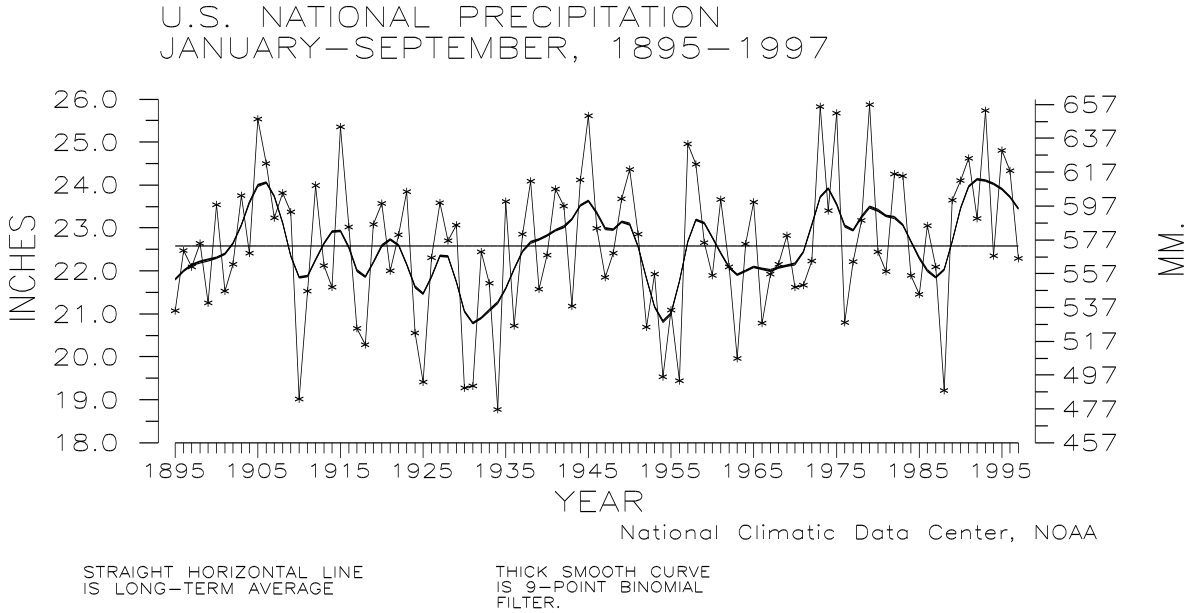

Figure 5: Preliminary precipitation data indicate that the year-to-date, January-September 1997, was the 44th driest such nine-month period since records began. About four percent of the country was much drier than normal while nearly ten percent of the country was much wetter than normal.

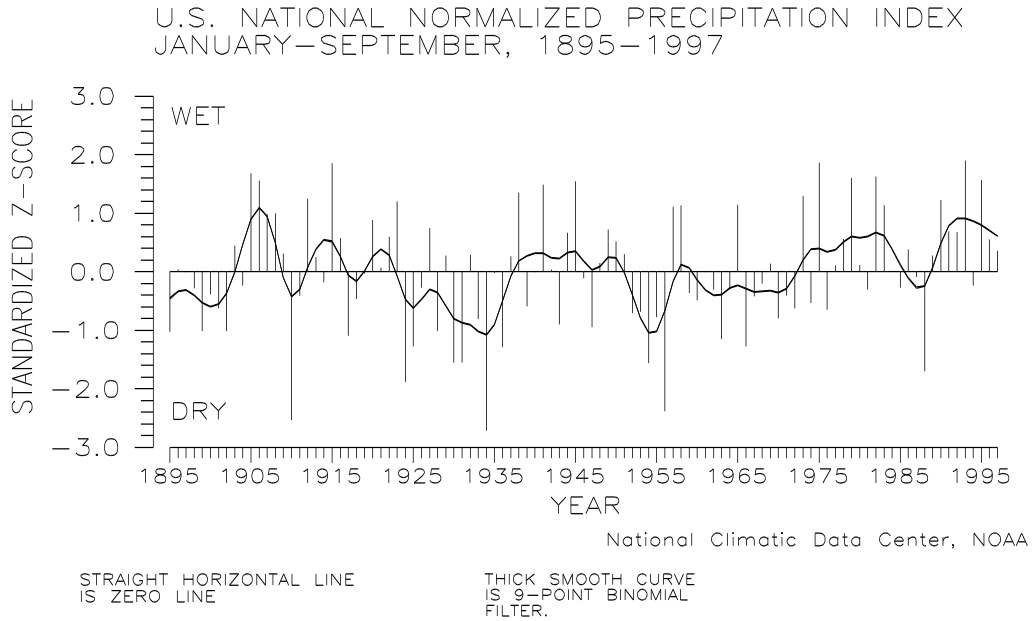

Figure 6: The preliminary national year-to-date standardized precipitation index ranked January-September 1997 as the 35th wettest such period since 1895.

SEPTEMBER 1997 STATEWIDE RANKS

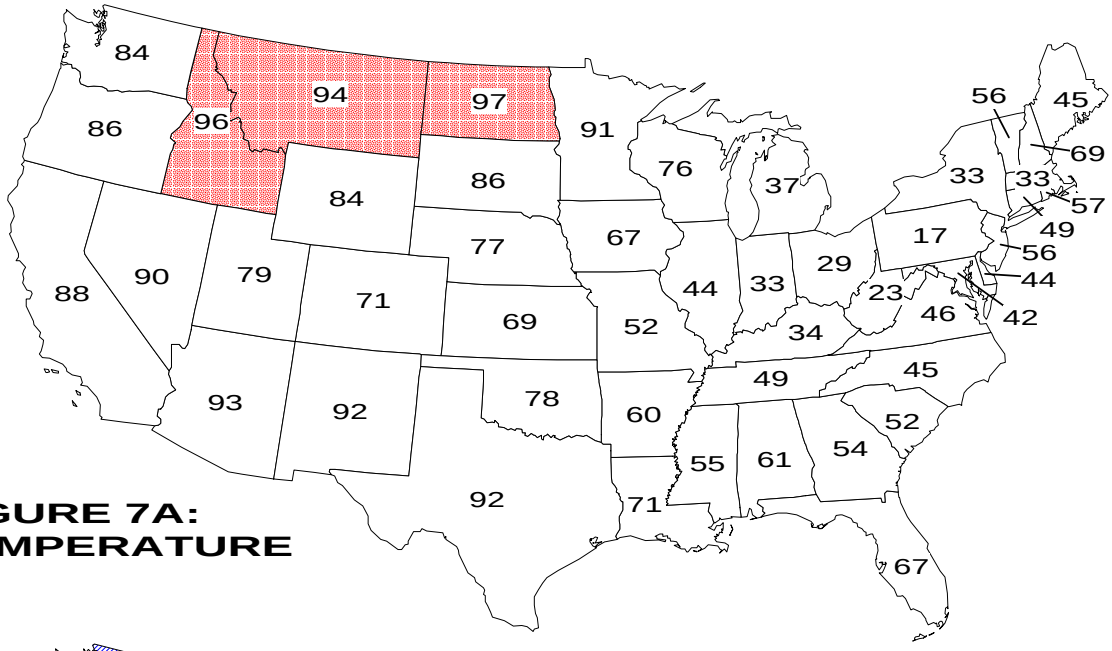

FIGURE 7A: TEMPERATURE

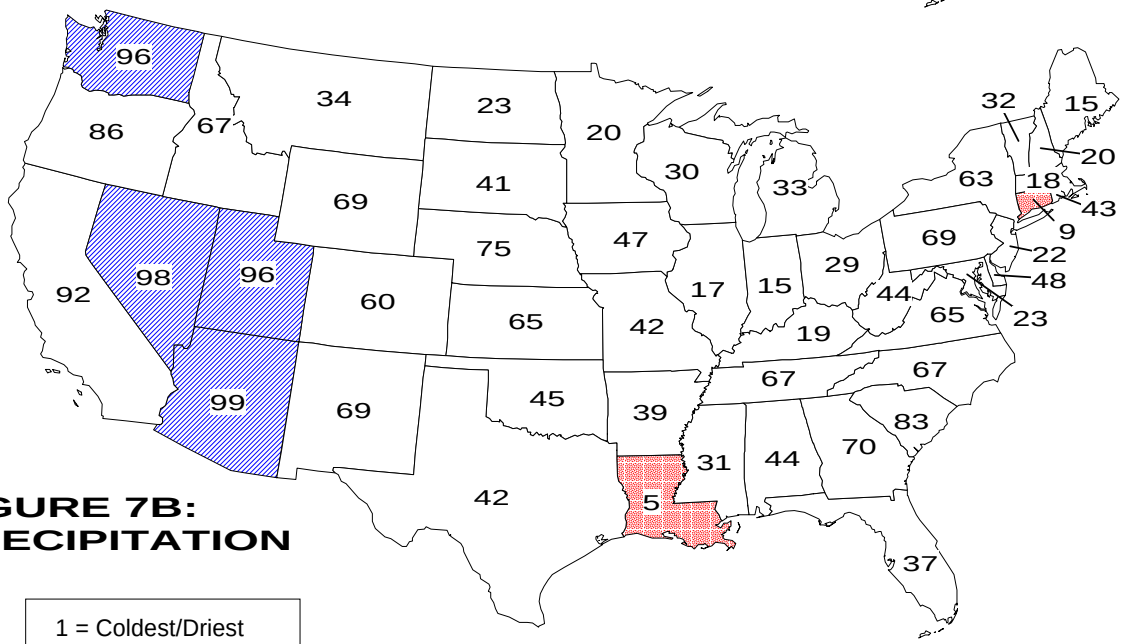

FIGURE 7B: PRECIPITATION

1 = Coldest/Driest
103 = Warmest/Wettest

National Climatic Data Center, NOAA

Temperature and Precipitation Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1997. States having a rank of top ten coldest or driest (rank 1-10) or top ten warmest or wettest (rank 94-103) are shaded.

JAN-SEP 1997 STATEWIDE RANKS

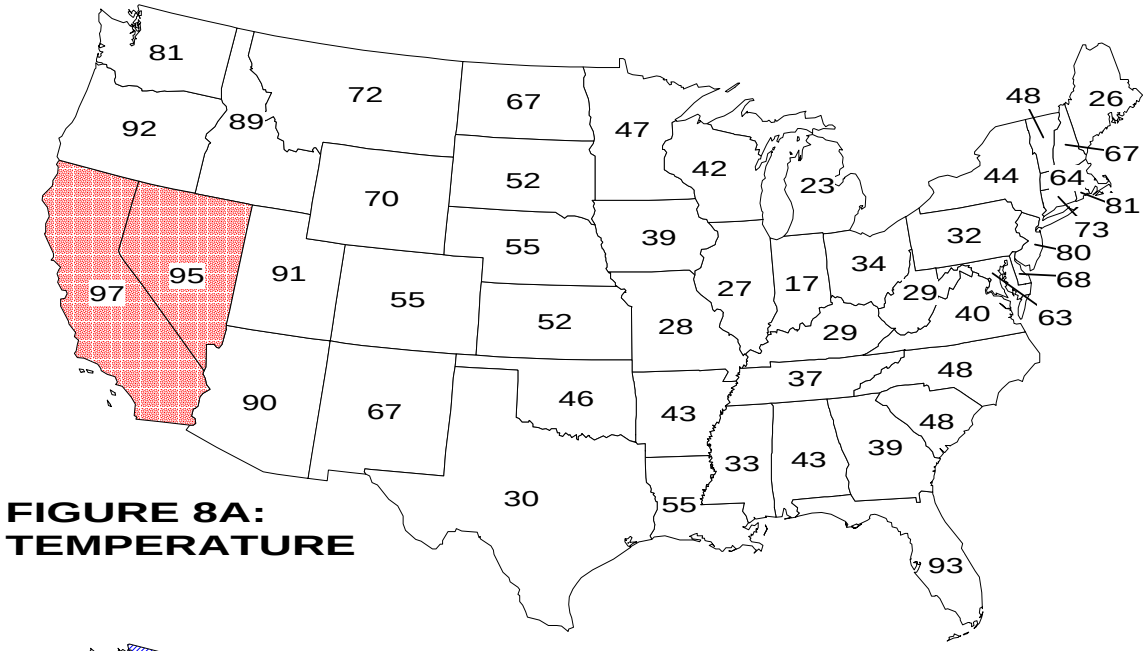

FIGURE 8A: TEMPERATURE

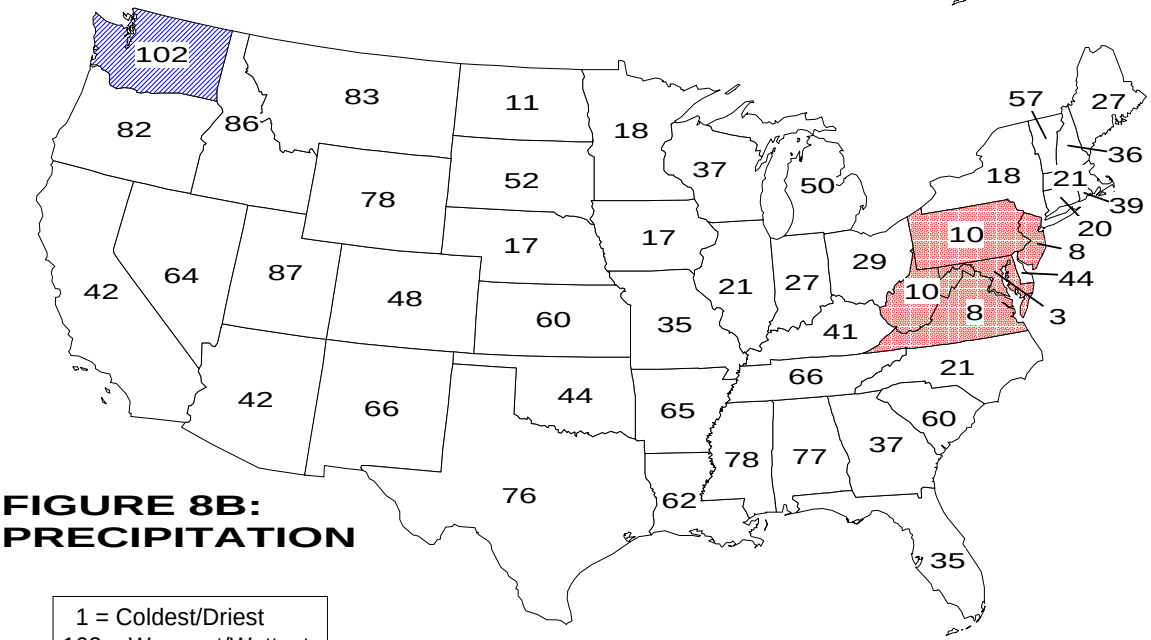

FIGURE 8B: PRECIPITATION

1 = Coldest/Driest
103 = Warmest/Wettest

National Climatic Data Center, NOAA

Temperature and Precipitation Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1997. States having a rank of top ten coldest or driest (rank 1-10) or top ten warmest or wettest (rank 94-103) are shaded.

Figure 7A shows, in illustrative map form, the September 1997 temperature rankings for the 48 contiguous states. No state was within the top ten cool portion of the historical distribution while seven were within the cool third of the historical distribution. Three states ranked within the top ten warm portion of the historical distribution while eighteen others ranked within the warm third of the distribution.

September 1997 state ranks for precipitation are shown in **Figure 7B**. Four states ranked within the top ten wet portion of the distribution while eight others ranked within the wet third portion of the distribution. Two states also ranked within the top ten dry portion of the historical distribution while sixteen others ranked within the dry third. ***It should be noted that these September state precipitation ranks are preliminary and should be used with considerable caution due to the high variability of precipitation on a small space and time scale.***

Year-to-date statewide temperature and precipitation ranks are shown in **Figures 8A and 8B**. Two states ranked within the top ten warm portion of the historical distribution while 11 others ranked within the warm third of the distribution. No state was within the top ten cool while eleven ranked within the cool third of the distribution. Five states had their tenth driest or drier January-September period while twelve others ranked within the dry third portion of the distribution. Only one state was within the top ten wet portion of the distribution for the nine-month period while nine ranked within the wet third of the historical distribution for the January-September period.

It should be emphasized that all of the temperature and precipitation ranks on these maps and in Table 1 are based on preliminary data. The ranks will change when the final data are processed.

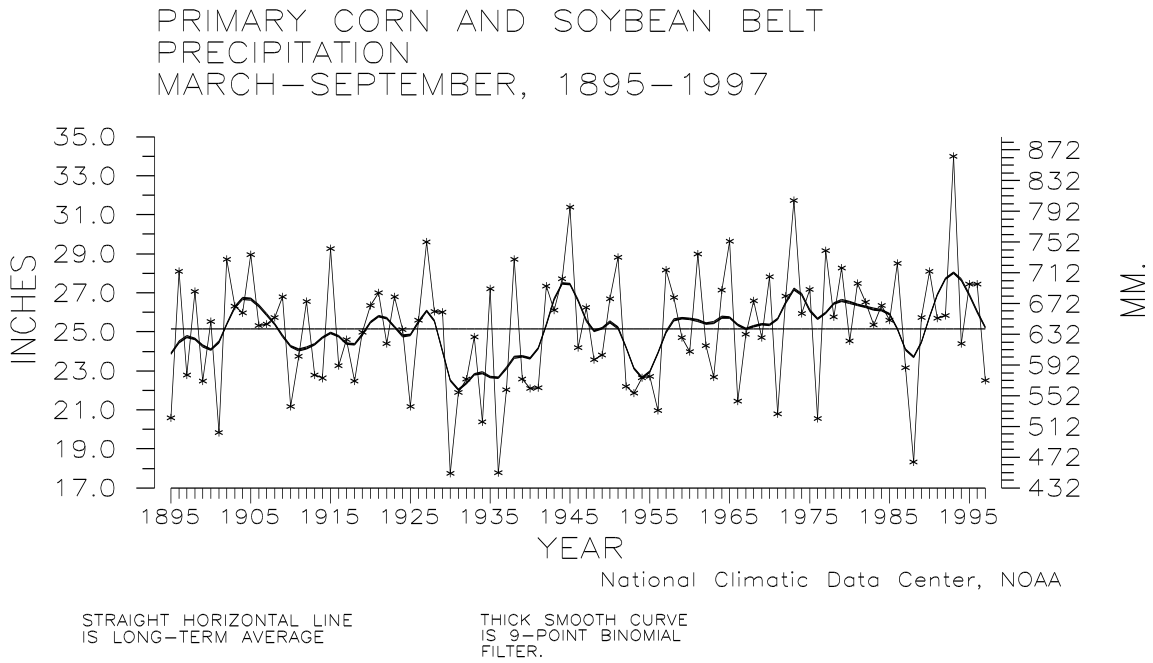

Figure 9: Preliminary data indicate that precipitation averaged across the Primary Corn and Soybean agricultural belt finished the 1997 season with below average values.

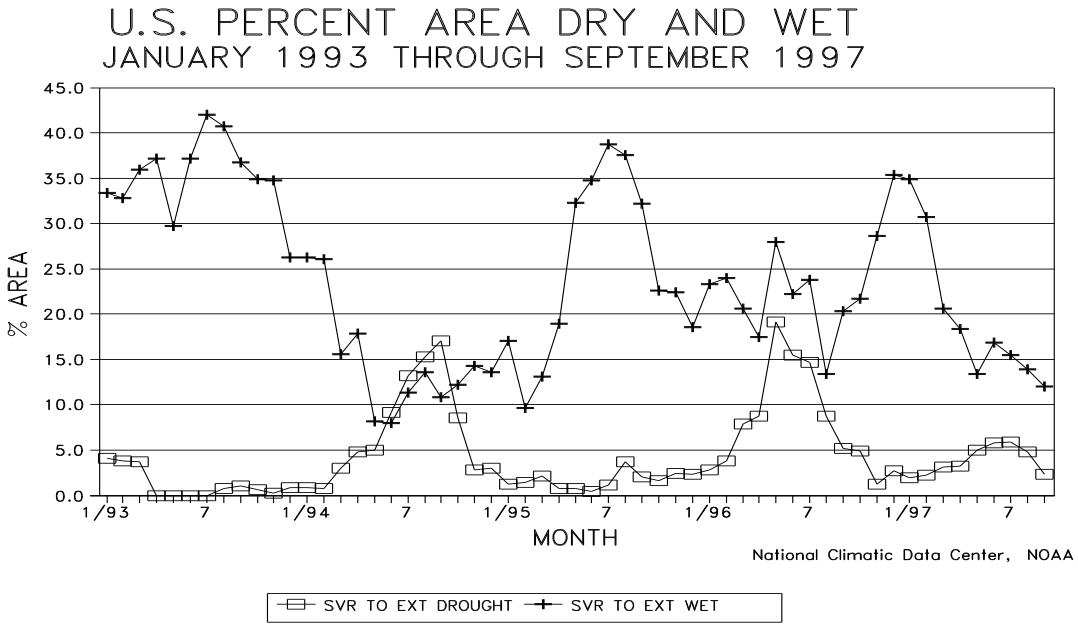

Figure 10: Long term drought coverage (as measured by the Palmer Drought Index) remained relatively low with September 1997 having slightly more than two percent of the country in severe to extreme drought. Twelve percent of the country experienced severe to extreme wetness during September. The core dry areas included portions of the Southwest and part of the mid-Atlantic and Northeast while core wet areas included much of the Pacific Northwest, Northern Rockies, South Dakota, and portions of the lower Mississippi valley and southern plains.

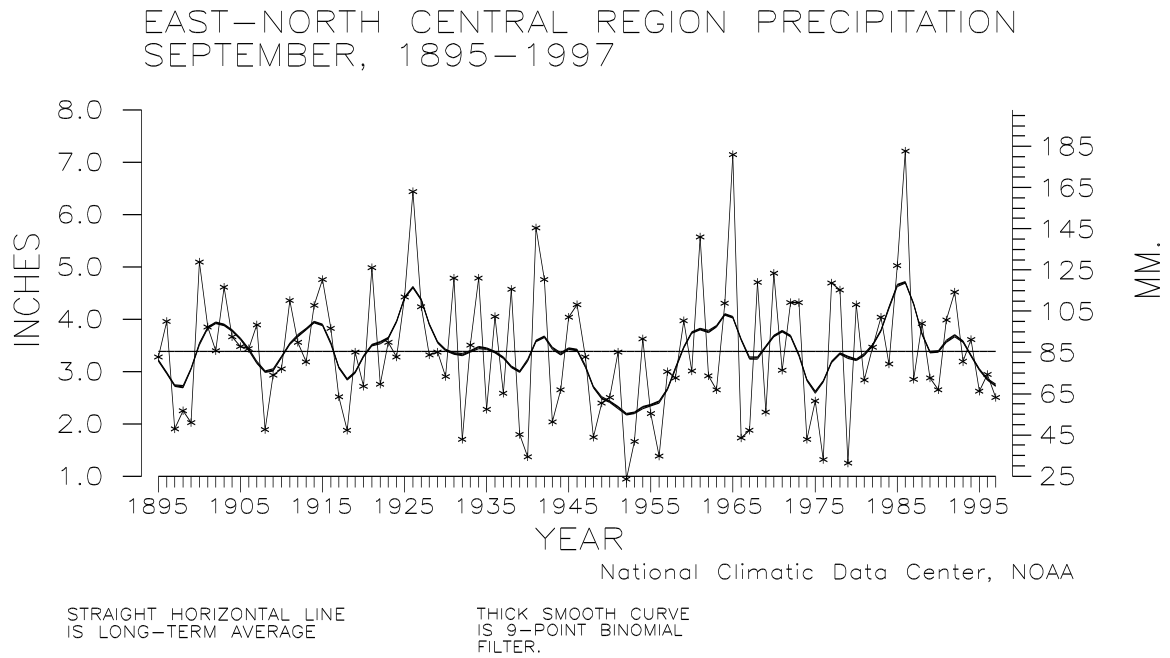

Figure 11: Preliminary data ranked September 1997 as the 24th driest such month on record for the East-North Central Region. The East-North Central Region includes the states of Iowa, Michigan, Minnesota, and Wisconsin.

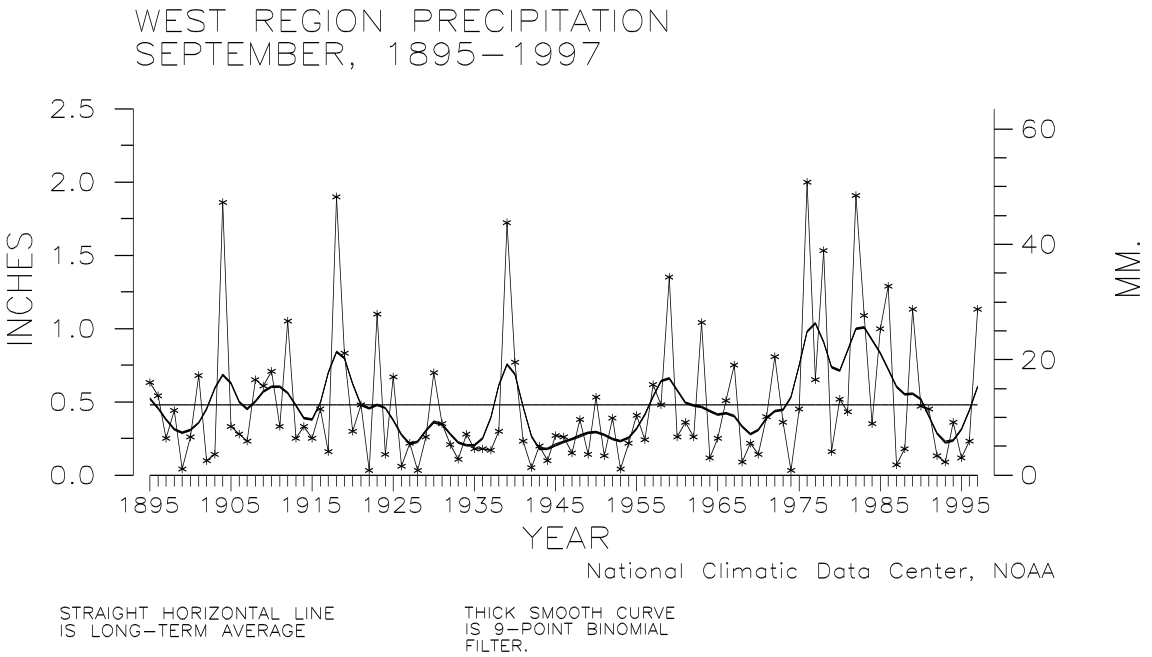

Figure 12: Preliminary data ranked September 1997 as the tenth wettest such month on record for the West Region. The West Region includes California and Nevada.

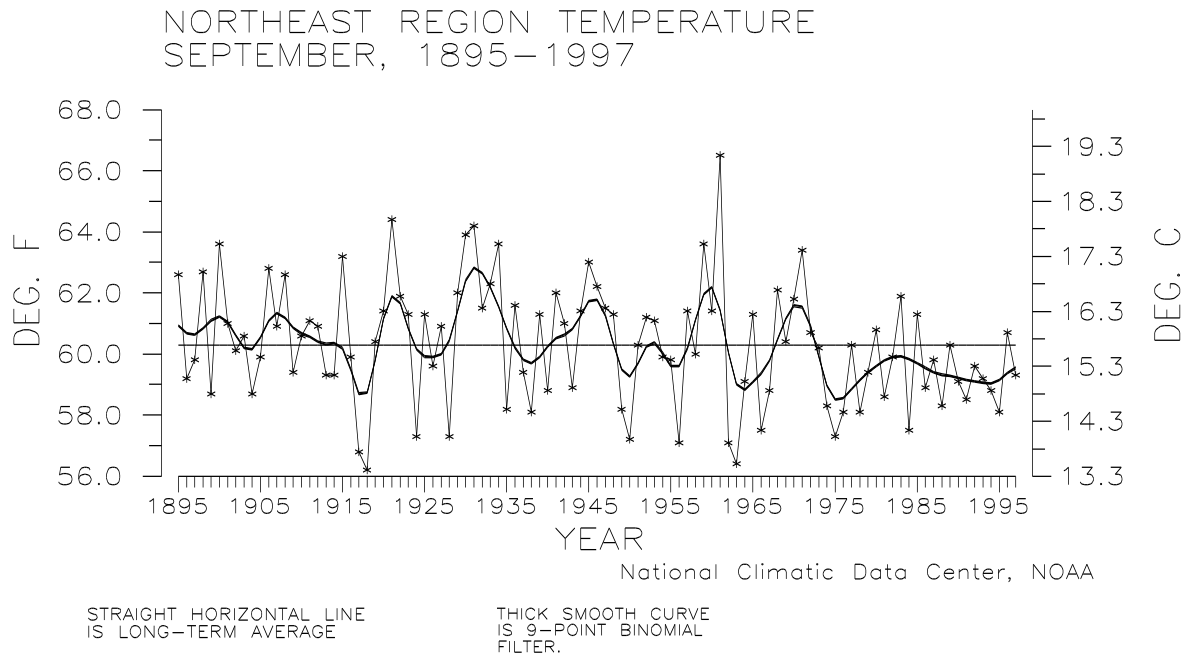

Figure 13: Preliminary data ranked September 1997 as the 33rd coolest such month on record for the Northeast Region. The Northeast Region includes Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont.

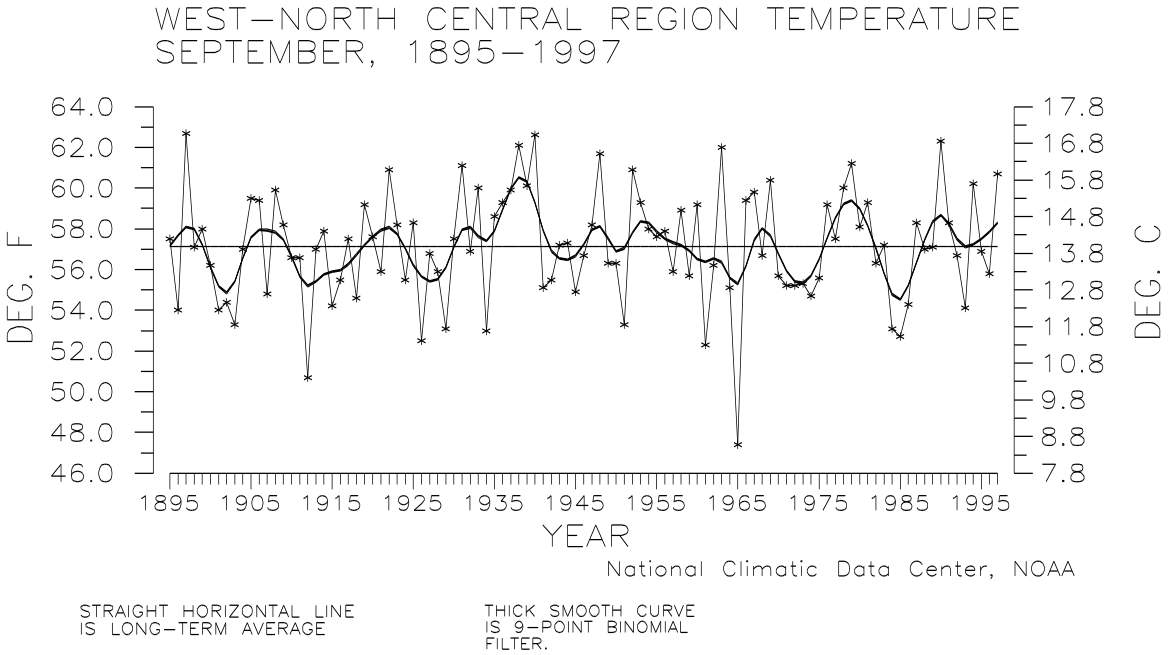

Figure 14: Preliminary data ranked September 1997 as the 11th warmest such month on record for the West-North Central Region. This region includes Montana, Nebraska, North Dakota, South Dakota and Wyoming.

MONTHLY MEAN TEMP. ANOMALY SEPT 1997

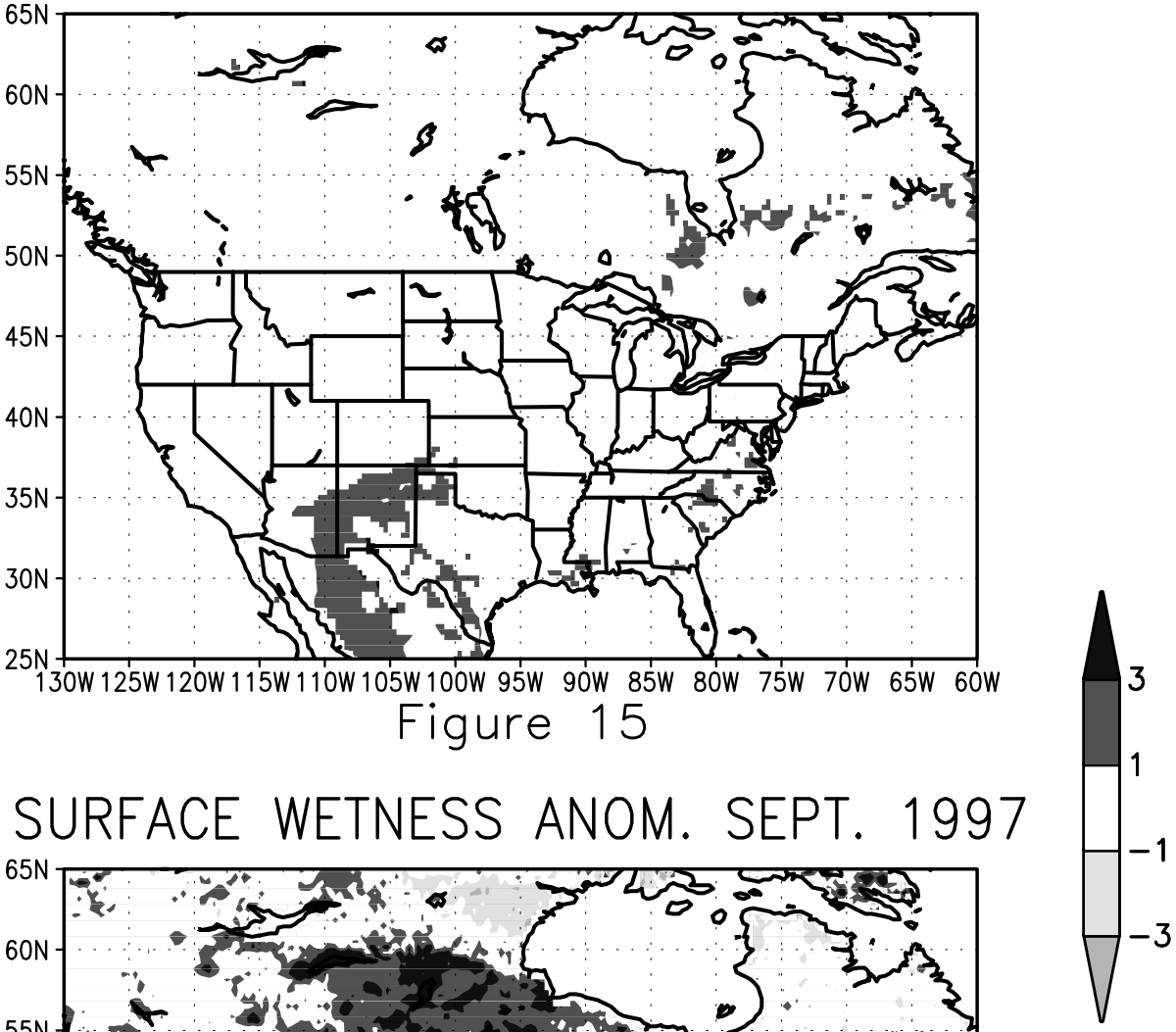

Figure 15

SURFACE WETNESS ANOM. SEPT. 1997

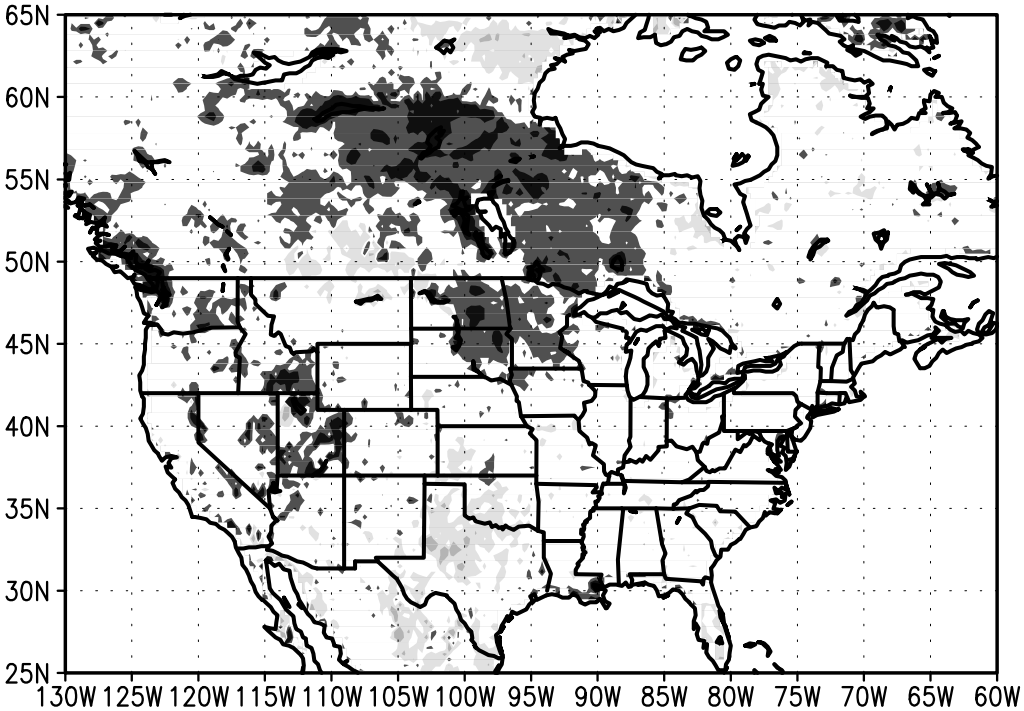

Figure 16

Figure 15 shows the mean monthly temperature anomalies for the month of September 1997. The base period is six years (1992-97). This experimental product is derived from the Special Sensor Microwave Imager (SSMI), an instrument flown on a polar orbiting satellite of the defense meteorological satellite program. (The May 1997 Climate Variation Bulletin provides a more comprehensive description of the product.) Above normal temperatures over parts of the southern U.S. cover parts of Arizona, New Mexico, Texas, and adjacent Mexico. Otherwise, the majority of the map has temperatures near normal.

Figure 16 shows the mean monthly surface wetness anomalies for the month of September 1997. This experimental product observes water on the surface, and it is also derived from the SSMI instrument. (See the May 1997 Bulletin for details about the product.) The wetness signature can be attributed to recent rain, melting snow, lakes, rivers, or irrigation; however, the product does not see sub-surface soil moisture. During this month excessive water on the surface was observed over sections of the northern plains and south central Canada, where convective activity was common during the first half of the month. Other wet areas included portions of the southwest U.S. and Washington state. The Southern plains were drier than usual, with the largest negative anomalies over western Texas. North central Canada was also drier than usual.

El Nino: Analog Years Regional Departures

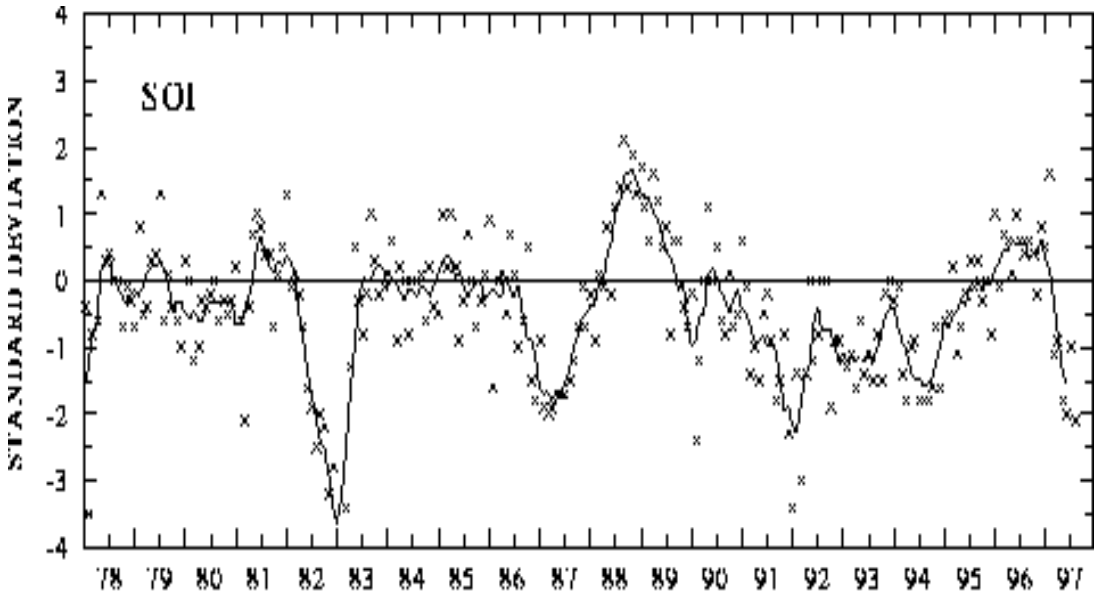

Figure 17: Anomalies for the Southern Oscillation Index (SOI) are departures from the 1951-1980 base period means and are normalized by the mean annual standard deviation. The graph and research are compliments of the Climate Prediction Center. Note the significant negative anomaly centered in mid-1983 and the two less-significant episodes in late 1986 and again in mid-1991.

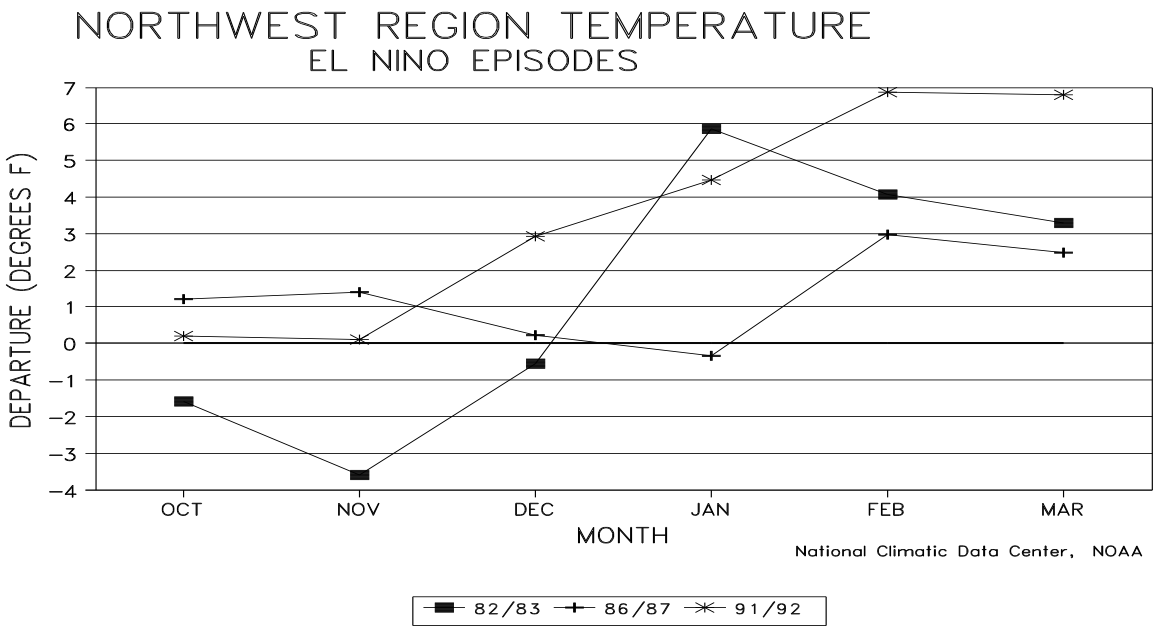

Figure 18: Based on research done at the Climate Prediction Center, the six-month period October through March is the period most influenced by an El Nino episode. Shown above are the temperature departures from the long-term mean for the Northwest region states of Idaho, Oregon, and Washington for each of the last three significant El Nino events. Of particular significance is the sudden jump in temperature from November 1982 to January 1983, which occurred during the strongest El Nino on record to date, and the persistent positive departures noted with the 1991/92 episode.

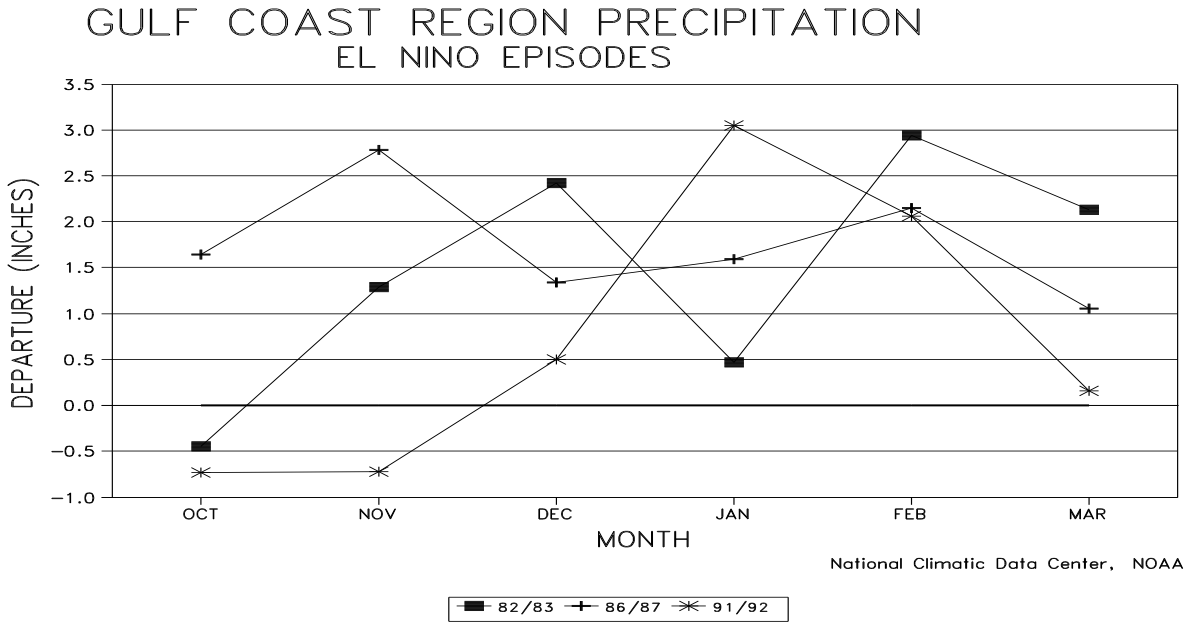

Figure 19: Research done at the Climate Prediction Center shows that during an El Nino event wetter than normal conditions can be expected for the Gulf Coastal region of the United States. Shown is the October-March period for each of the past three significant episodes. Positive departures are noted for nearly the entire period.